

Oct. 6, 1959

A. M. ANDERSON
CUSHION FILLING MACHINE

2,907,156

Filed Oct. 4, 1955

7 Sheets-Sheet 1

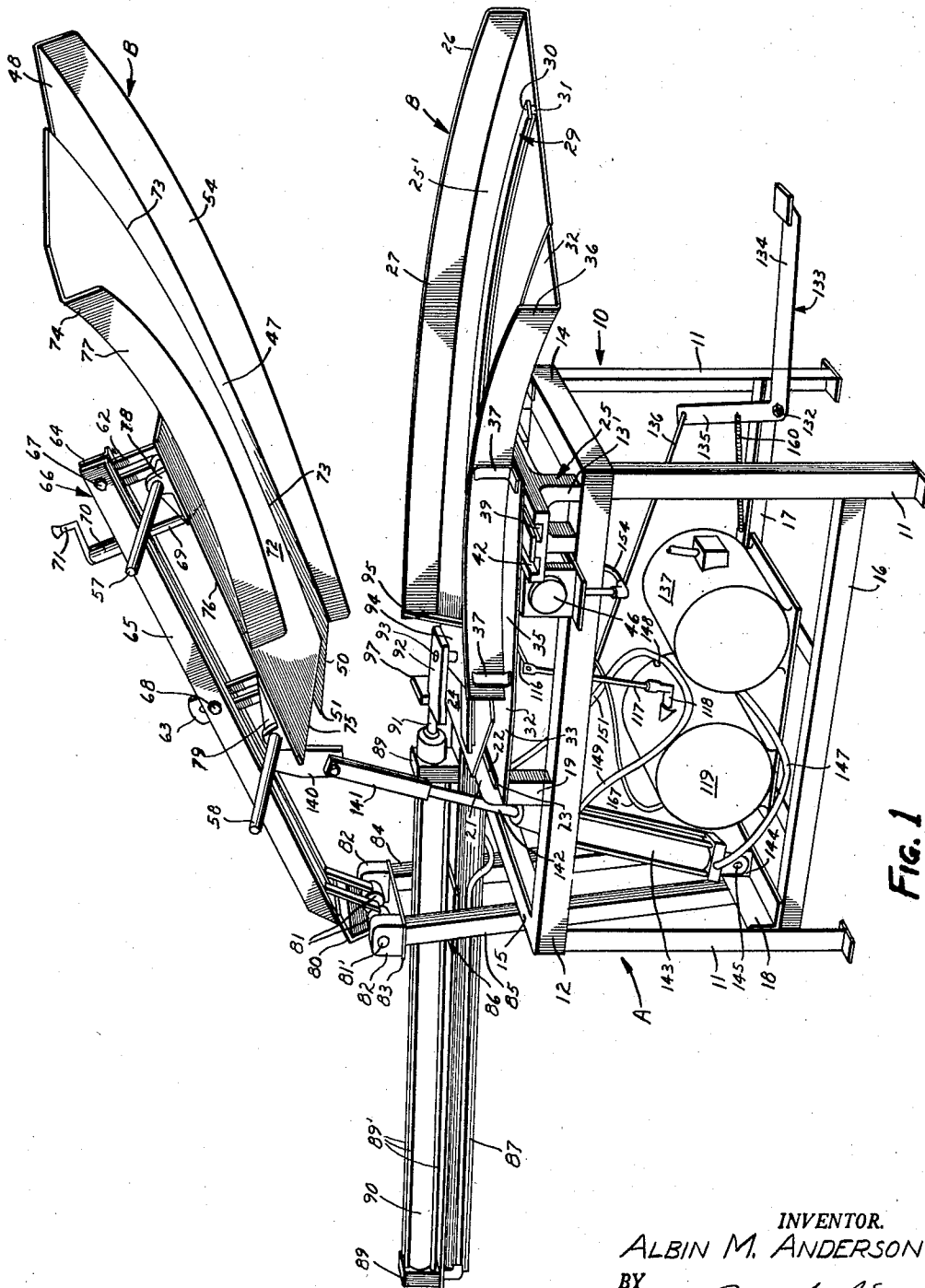


FIG. 1

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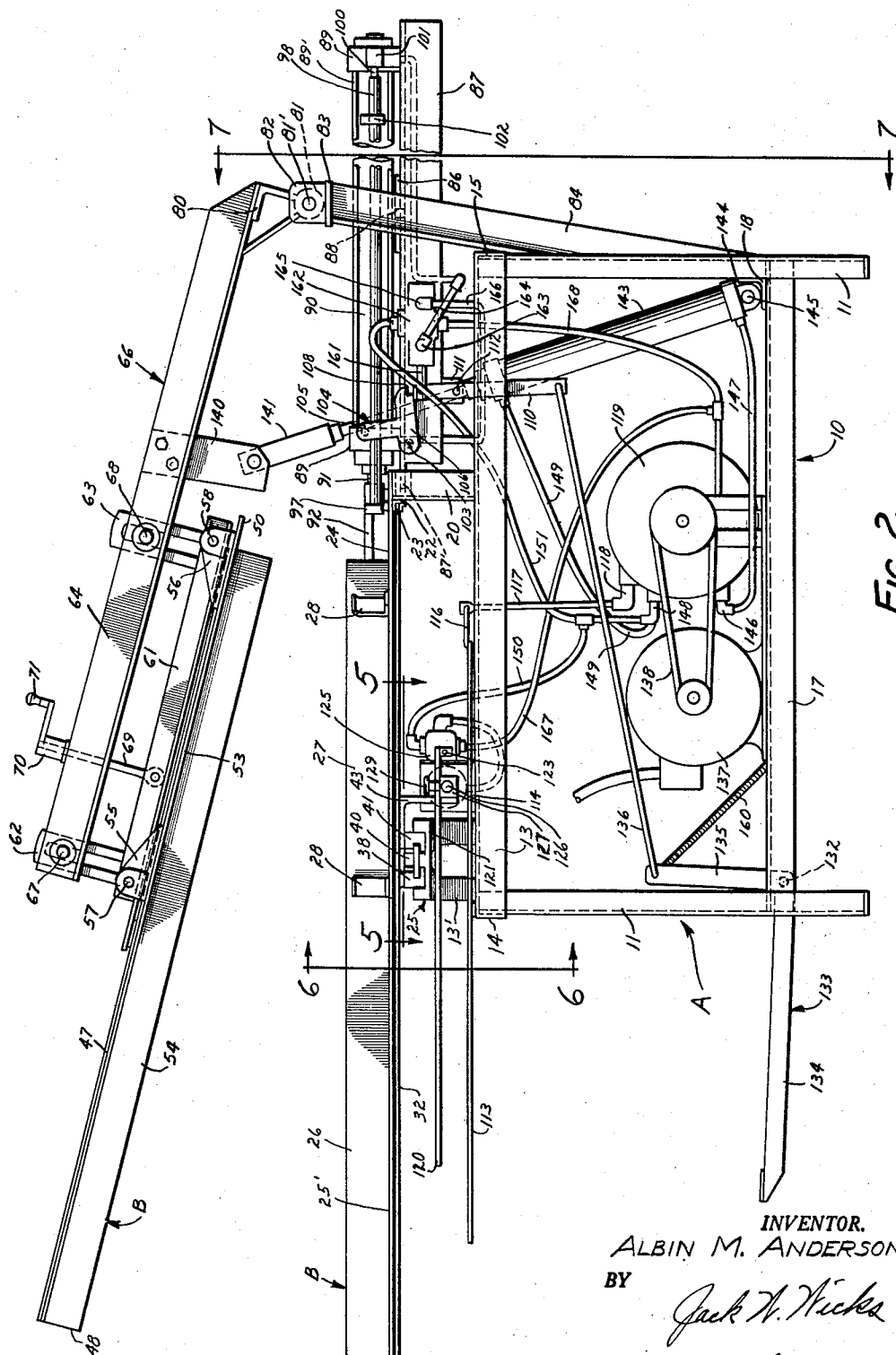


FIG. 2

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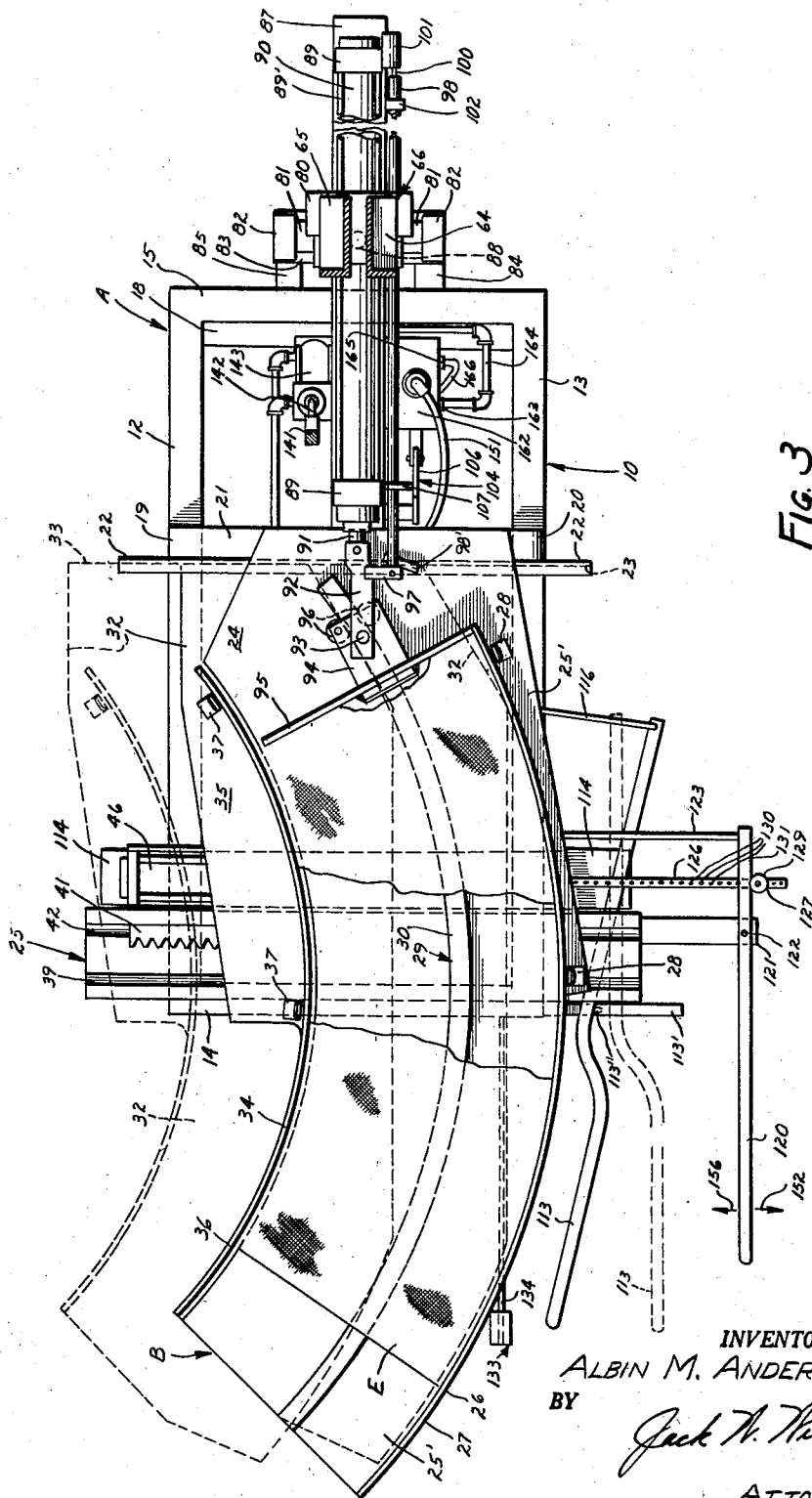
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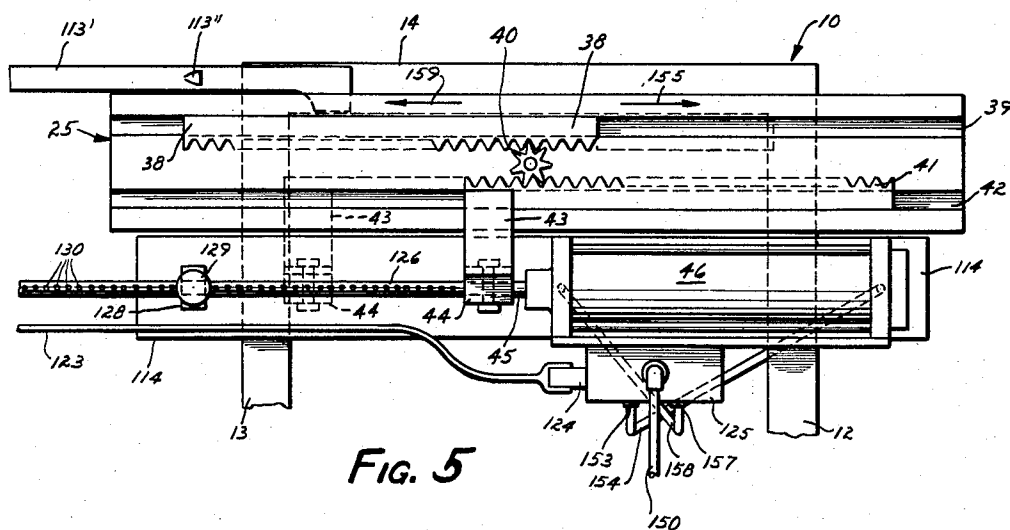


Fig. 5

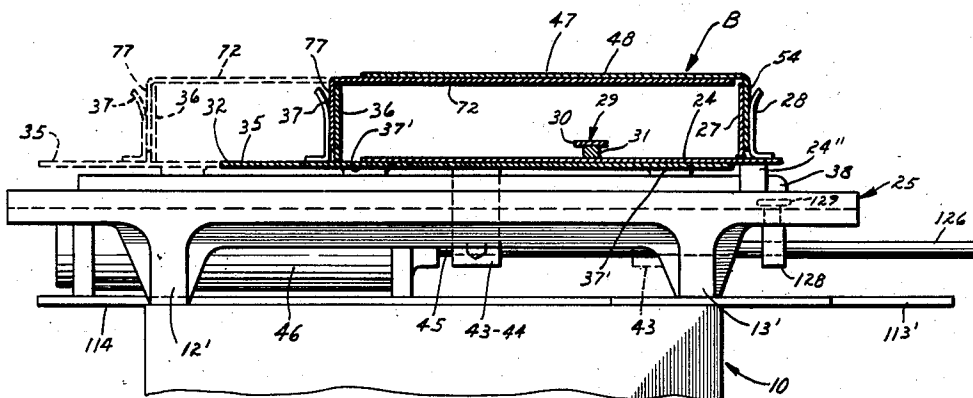


Fig. 6

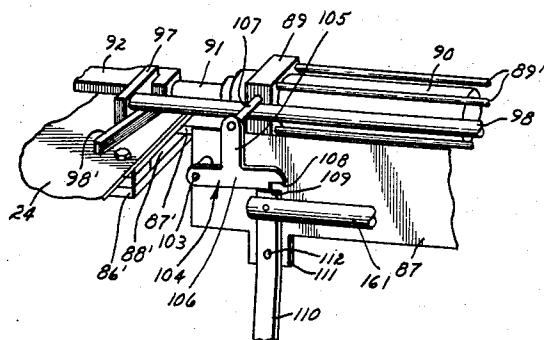


Fig. 10

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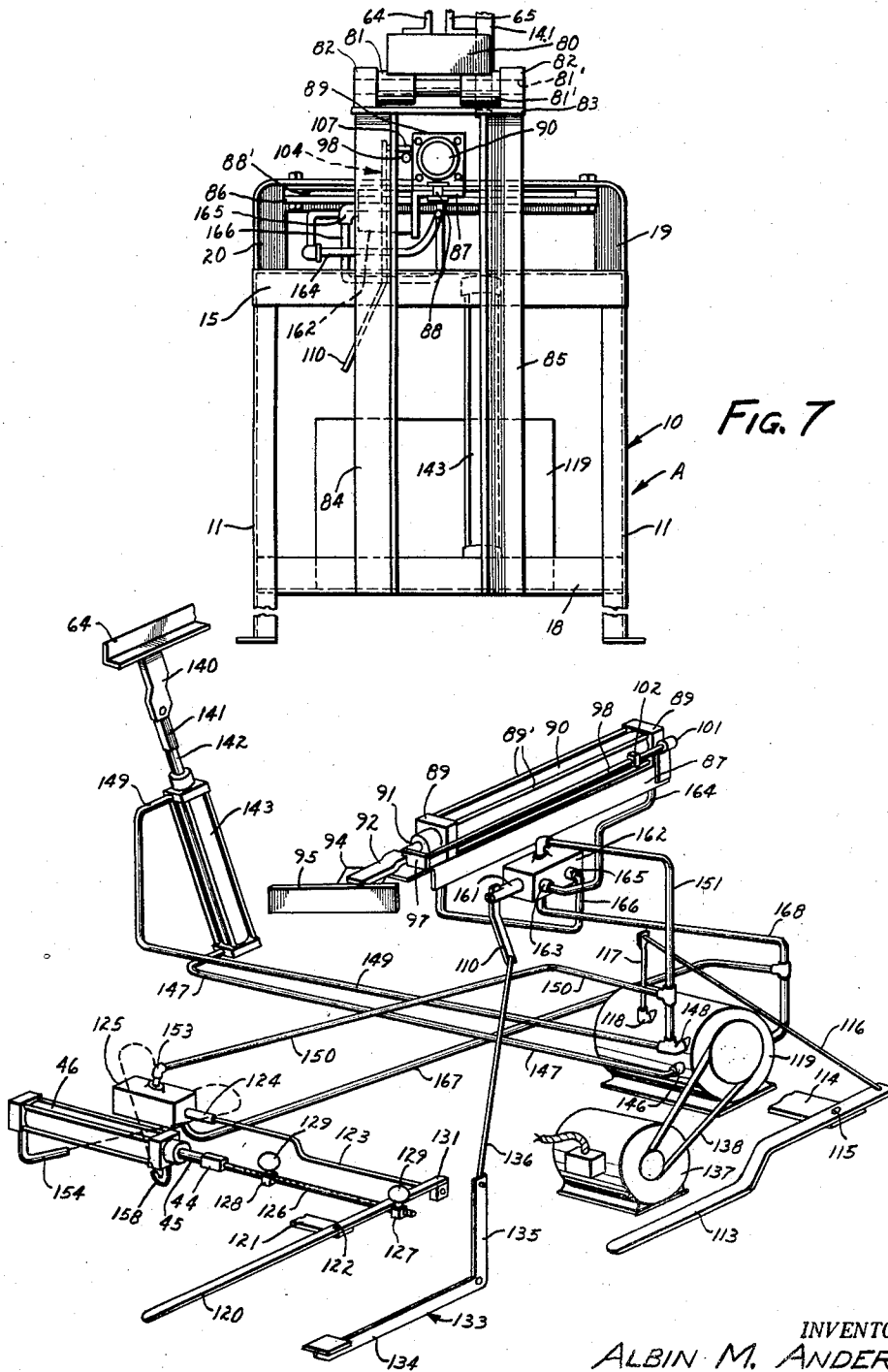
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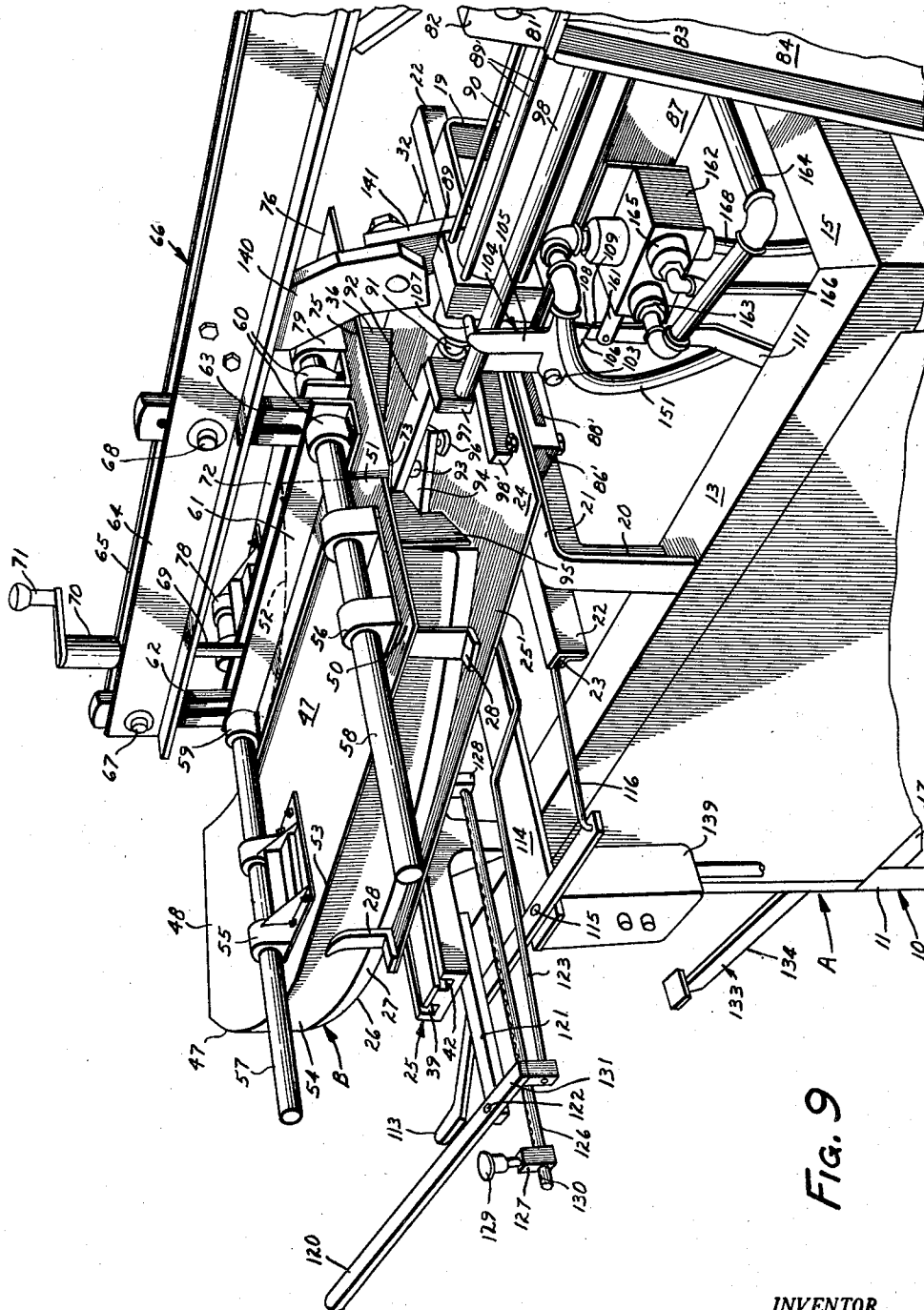
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CUSHION FILLING MACHINE

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7 Sheets-Sheet 7



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2,907,156

CUSHION FILLING MACHINE

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Application October 4, 1955, Serial No. 538,424

14 Claims. (Cl. 53—124)

My invention relates to an improvement in a cushion filling machine and more particularly to a machine for filling cushions which are arcuate in shape.

It is an object of my invention to provide a self-contained apparatus by means of which the spring assembly and other filling material of a curved cushion may be rapidly inserted in the cushion casing or cover with a minimum amount of manual labor, the machine being so constructed that it is adapted for use with a large range of cushion sizes.

My machine embodying the invention includes a receiving hopper box rectangular in cross section and curved in formation, preferably formed of sheet metal and having one open end and a hinged hopper cover. The spring assembly and other filling material are placed in the receiving hopper, and the hinged cover is closed and locked in closed position. The sides of the hopper are then moved inwardly to compress the filling material slightly, and the cover of the cushion is placed on the hopper in such a manner as to cover the open end. A pivotally mounted pusher plate travelling on an arcuate track within the hopper is advanced within the hopper to force the filling material out the open end thereof into the cover and to force the cover from the hopper box. The pusher plate or ram is then automatically retracted, and the hopper cover is opened ready for receiving filling material for the next cushion.

The principal features of the invention reside in the combination and arrangements of parts by which the above described operations are carried out. A feature of my invention resides in particular means for the operation of the pusher plate along an arcuate path within the arcuately formed hopper. The pusher plate travels on the radii of the arcuate hopper box. Another feature is the arcuately formed hopper. Still another feature is the hydraulic system for actuating the hopper cover, pusher plate and hopper walls.

I shall not here attempt to set forth and indicate all of the various objects and advantages incident to my invention, but other objects and advantages will be referred to in or else will become apparent from that which follows.

The invention will appear more clearly from the detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals are employed to designate like parts throughout.

In the drawings forming part of this application:

Figure 1 is a perspective view of my cushion filling machine with the top of the hopper in raised position and the pusher plate in retracted position, the side panels of the base being removed.

Figure 2 is a side elevational view of my machine shown in Figure 1.

Figure 3 is a top plan view thereof showing the extendable side of the hopper in extended position in broken lines and the pusher plate in retracted position, the top of the hopper being removed.

Figure 4 is a top plan view similar to that of Figure

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3 but with the pusher plate in a partially advanced position and in a fully advanced position in broken lines with the pivoted position of the cylinder and pusher rod member illustrated.

Figure 5 is a section on the line 5—5 of Figure 2 showing the mechanism for expanding or contracting the width of the hopper.

Figure 6 is a section on the line 6—6 of Figure 2 showing the construction of the hopper and other detail.

Figure 7 is a view on the line 7—7 of Figure 2 showing the rear end of the machine with the hopper and the mechanism for raising the same removed.

Figure 8 is an exploded perspective view of the hydraulic system for operation of the various movable parts also illustrated.

Figure 9 is a perspective view of a portion of my machine quartering from a rear corner thereof with the hopper cover in lowered position and the pusher plate in full retracted position.

Figure 10 is a detailed fragmentary perspective view of a portion of the pusher plate actuating mechanism and the latch member therefor.

Figure 11 is a perspective view of an arcuate cushion filled by my machine.

Referring to the drawings in detail, my cushion filling machine A is composed of the base 10 which includes the four corner upright legs 11 which have secured to the top ends thereof the top frame portion consisting of the longitudinal side frame members 12 and 13 and the transverse end frame members 14 and 15. The leg members 11 are further braced by means of the lower longitudinal members 16 and 17. The base 10 also includes the transverse support member 18 hereinafter referred to. Secured to the top of the side frame members 12 are the upright supports 19 and 20 connected to the transverse horizontal support 21. The horizontal support 21 has secured to the front upper edge thereof the angle member 22 which has formed thereon the horizontally disposed track or recess 23.

I further provide the lower hopper plate member 24 which is secured at its rear edge 24' to the top of the horizontal support 22 and which forms a support for the other hopper members. The plate 24 is also secured midway of its length to the block 24'' mounted on the transverse support 25. The support 25 is mounted on the frame members 12 and 13 by means of the upright supports 12' and 13'. A portion of the plate member 24 is formed with the straight edge portion 25' while the front outer edge is arcuately formed as at 26. Secured to the portion 25' of the plate 24 and along the extended arcuate edge 26 is the upstanding arcuate wall member 27 forming a portion of one side of the extendable hopper B.

The lower hopper plate member 24 has secured thereto the upstanding guide members 28 which are spaced slightly from the wall member 27 for guiding one of the upper hopper walls as hereinafter set forth. In addition, the hopper plate 24 has secured thereto the arcuate track 29 formed of the top rail portion 30 and the support 31. It is apparent that the track 29 is formed on the same curve as the arcuate wall 27.

I further provide the additional lower movable plate 32 which is complementary to the plate 24 and forms a portion of the other half of the bottom of the hopper B. The plate 32 is movable beneath the plate 24 and is formed with the straight rear edge 33 which is positioned in the horizontal transverse track or recess 23. The lower plate 32 is further formed with the arcuate edge portion 34 and the extended portion 35 which is part of the rear edge portion 33. Secured to the arcuate edge 34 and the extended portion 35 is the arcuate upstanding wall 36 which is formed on the same curve as the wall 27. The movable plate 32 and the wall 36 together with the sta-

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tionary plate 24 and the wall 27 form the extendable bottom half of the hopper B.

The additional upstanding guides 37 are secured to the extended portion 35 of the plate 32 and are spaced slightly from the wall 36 to allow the entrance of the upper hopper wall hereinafter described.

The underside of the plate 32 is secured substantially centrally at 37 to the top edge of the driven rack 38 which is slidably mounted in the recess 39 of the transverse support 25. Pivotally mounted on the support 25 is the pinion 40, the teeth of which engage the teeth of the driven rack 38. In addition I provide the driving rack 41 which is slidably positioned in the recess 42 of the support 25, and the teeth of which engage the teeth of the pinion 40. The rack 41 has secured thereto the bracket 43 which bracket is secured to connector member 44 mounted on the outer end of the shaft 45 which extends from the cylinder 46. The shaft 45 is secured to a conventional double action piston (not shown) mounted within the cylinder 46 which is actuated by the hydraulic system and controls hereinafter described to drive the rack 41 in either direction. As the rack 38 is driven, the plate 32 is thereby moved to expand or contract the size of the hopper B.

I further provide the upper plate member 47 which is formed with the arcuated outer end 48, the straight edge portion 49, the straight rear edge portion 50, the radially disposed edge 51, and the arcuate edge 52. The upper plate member 47 has secured to the arcuate edge 53 thereof and extending to the edge 50 the arcuated depending side wall portion 54 forming the upper half side of the hopper B. It will be seen that the wall portion 54 fits between the guide members 28 and the upstanding wall 27 when the plate 47 is lowered by means hereinafter described.

The plate 47 has secured to the top surface thereof the hanger members 55 and 56. These hanger members are formed with holes through which the horizontal supporting rods 57 and 58 extend. The rods 57 and 58 extend through holes formed in the bosses 59 and 60 respectively which are formed on the elongated adjustable bracket member 61. The bracket member 61 has secured to the ends thereof the slotted upstanding members 62 and 63 which are positioned between the parallelly disposed angle members 64 and 65 forming the pivoted lift arm 66. The slotted members 62 and 63 are secured in the desired position on the arm 66 by means of the bolts 67 and 68. With the bolts 67 and 68 loosened, the bracket member 61 is raised or lowered by means of the screw 69 which is secured to the same and drawn up by means of the turning knob 70 having the handle 71. With the bracket 61 in the desired position which determines the height or depth of the hopper B through the members described, the bolts 67 and 68 are then secured.

I further provide the upper plate 72 forming the upper remaining half of the hopper B. The plate 72 is formed with the outer arcuated side edge 73 and an inner arcuated side edge 74 together with the straight rear edge portion 75 which is substantially in line with the edge 50 of the plate 47. The plate 72 is also formed with the straight edged portion 76, and it will be seen that the plate 72 is movable substantially transversely under the plate 47. The arcuate depending wall 77 is secured to the plate 72 at the arcuate edge 74, and the plates 47 and 72 together with the walls 54 and 77 respectively form the extendable upper half of the hopper B. When the arcuate wall 77 is lowered by mechanism hereinafter described the same fits between the guides 37 and the wall 36, and in this lowered secured position, the plate 72 and wall 77 are moved on the rods 57 and 58 as the plate 32 is moved through the movement of the rack and pinion mechanism hereinbefore described.

Secured to the upper surface of the portion 76 of the plate 72 are the hanger members 78 and 79 having holes

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formed therethrough and through which the supporting rods 57 and 58 slidably extend.

The lift arm 66 has secured to the rear end thereof the bracket 80 which has the bosses 81 formed thereon which are pivotally mounted on the pin 81' which in turn is mounted in the bearing members 82 secured to the plate 83. The plate 83 is secured to the top ends of the angle braces 84 and 85 which braces are secured to the end frame member 15 and the transverse support member 18.

Secured to the braces 84 and 85 is the transverse horizontal plate member 86 on which is pivotally mounted the elongated horizontal angle support member 87 by means of the pin 88. The horizontal support member 87 has formed on the forward end thereof the lip portion 87' which extends into the elongated recess 88' formed in the block member 86' secured to the underside of the rear end of the plate 24 (Fig. 10). The lip 87' aids in supporting the support 87 together with the plate member 86 and the pin 88. Further, as the support member 87 pivots, the lip 87' freely moves transversely of the base 10 in the recess 88' with the lip bearing upwardly against the underside of the block portion 86' forming the recess 88' thereby adequately supporting the support 87 in its pivoted movement.

Mounted on the pivoted support member 87 by means of the blocks 89 and the rods 89' is the elongated cylinder 90 in which is mounted the shaft 91. Inside the cylinder 90 is positioned a double action piston having conventional leathers, and this piston is secured to the inner rear end of the pusher shaft 91 and operated by the hydraulic system hereinafter described.

Secured to the outer end of the shaft 91 is the connecting member 92, and the outer end of the member 92 is pivotally mounted on the pin 93 which is secured to the plate 94. The plate 94 has secured thereto the pusher plate or ram 95 which rides above and just clear of the hopper plate 24. The plate 94 rides on top of the arcuate track 29 and positioning the plate 94 on the track 29 are the bearings 96 mounted on the underside of the plate 94 at each corner thereof. The bearings 96 engage against both sides of the support portion 31 of the arcuate track 29 and underneath the outer edges of the top rail portion 30.

The connecting member 92 has secured thereto the short arm 97 to which is secured the forward end of the hollow trip rod 98. The hollow trip rod 98 is further supported by means of the small elongated rod 100 which is secured to the block 101 and which extends into the hollow rod 98 so that the rod 98 "rides" on the rod 100 in its travel as will be explained further on. Further, the trip rod 98 rides on the bar support 98' at all times. Mounted on the trip rod 98 is the trip lug 102. Pivotally mounted on the inner end of the pivoted support member 87 by means of the pin 103, is the latch member 104 which includes the vertical portion 105 and the horizontal portion 106 which mounts the pin 103. The upper end of the vertical portion 105 is formed with a finger 107 extending at right angles thereto and towards said front block 89. The rear end of the horizontal portion 106 of the latch 104 is formed with the notch 108 which engages with the upper end 109 of the arm 110 which is pivotally mounted on the support 87 by means of the bracket 111 and the pin 112 secured thereto.

I further provide the elongated master handle control member 113 which starts the pump and is used to raise the upper part of the hopper and is pivotally mounted on the bracket plate 114 by means of the pin 115. The bracket plate 114 extends transversely of the base 10 and is secured to the side frame members 12 and 13. The bracket plate 114 is also the support for the cylinder 46. Pivotally connected to the outer rear end of the handle 113 is the horizontal rod 116 which is pivotally connected to the upper end of the vertical rod 117. The lower end of the rod 117 is connected

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to the elbow connector 118 which operates a double acting inlet-outlet valve mounted in the pump indicated as 119. The handle 113 rests on the bar 113' which has formed on the surface thereof the lug 113'' formed with a leading ramp portion.

The handle control 120 is pivotally mounted on the bracket 121 by means of the pin 122, the bracket 121 being connected to the underside of the support 25. Pivotally connected to the outer rear end of the handle 120 is the rod 123, and the rod 123 is also connected to the shaft 124 which operates the valve 125.

I further provide the adjusting rod 126 which is connected to the connector member 44 (Figures 5 and 8) and on which are mounted the stop blocks 127 and 128. The blocks 127 and 128 are adjustably secured on the rod 126 by means of the screw members 129 threadably mounted thereon, the lower ends of which are engageable with any of the depressions 130 formed therein. The positioning of the block 128 on the rod 126 determines the extent that the plate 32 and wall 36 move outwardly to determine the width of the hopper B, for the block 128 strikes the end portion 131 of the handle 120 and through the rod 123 the valve 125 is stopped. Also, the closing limit of the plate 32 may be controlled by the setting of the block 127 on the rod 126, the block 127 striking the handle end portion 131 thereby shutting off the valve 125 through the rod 123.

Pivotally mounted on the longitudinal member 17 of the base 10 by means of the pin 132 is the foot control member 133 formed of the horizontal portion 134 and the right angular upstanding leg portion 135. A rod 136 is pivotally connected to the upper end of the leg portion 135 and the lower end of the arm 110. I further provide the motor 137 which drives the pump 119 by means of the belt 138. The motor 137 is operated by the start and stop switches mounted in the box 139 and suitable conventional wiring not shown.

Secured to the pivoted lift arm 66 is the depending bracket member 140 which has pivotally connected thereto the arm 141. The arm 141 is connected to the shaft 142 which extends into the cylinder 143 pivotally connected at its lower end to the transverse support member 18 by means of the bracket 144 and the pin 145. Mounted on the shaft 142 and within the cylinder 143 is a double action piston and leathers not shown.

Operation and hydraulic control system

In a further description of the construction and operation of my filling machine A, the motor 137 is started, and the upper half of the hopper B is lifted from a closed position through the arm 66 by moving the control handle 113 to the position shown in broken lines in Figure 3. As a result of such a movement of the control 113, the rod 117 operates a valve in the pump 119 which pressurizes the lower port 146 of the pump 119 which introduces fluid pressure into the lower part of the riser cylinder 143 through the line 147 thereby forcing the piston in said cylinder upwardly and moving the shaft 142. As a result the arm 66 is forced upwardly through the arm 141 and bracket 140. To lower the arm 66, the control arm 113 is moved to the position shown in full lines in Figures 3 and 4 behind and against the lug 113'', and in this position the rod 117 is moved in the opposite direction which pressurizes the upper port 148 of the pump 119 which introduces fluid pressure into line 149 and also lines 150 and 151. As a further result of the action of the valve of the pump 119 the line 147 becomes a return line and the piston in the cylinder 143 is returned to the bottom thereof thereby allowing the arm 66 and the top of the hopper to lower and close.

To expand the hopper laterally the arm 66 must be lowered and the hopper B closed with the wall 77 positioned between the guides 37 and the wall 36. In this position the lever 113 must be in the position shown in Figures 3 and 4 in full lines. Then in order to expand

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the hopper B, the lever 120 is moved in the direction of the arrow 152 of Figure 4, and as a result the port 153 of the valve 125 is opened thereby allowing fluid pressure to enter the line 154 and forcing the piston in the cylinder 46 inwardly of the machine frame to move the block 44 (Figures 5 and 8) and bracket 43 to further move the rack 41 to which the bracket 43 is secured. Through the pinion 40 the rack 38 is moved in the direction of the arrow 155 thereby moving the plate 32 and the walls 77 and 36 outwardly and increasing the width of the hopper B. The plate 32 is secured to the rack 38, and as the rack 38 is moved so is the plate 32 and the wall 36 and guide 37 mounted thereon. In this movement the wall 36 is moved against the wall 77 thereby moving the plate 72 outwardly on the rods 57 and 58.

To contract the hopper B, the handle 120 is moved in the direction of the arrow 156, and as a result the port 157 is opened allowing fluid pressure to enter the line 158 forcing the piston in the cylinder 46 outwardly of the machine thereby moving the rack 38 in the direction of the arrow 159 (Fig. 5) to thereby contract the side walls of the hopper. In contracting the hopper, as above, the line 154 acts as a relief line.

In the operation of the pusher plate 95, the foot control member 133 is depressed against the action of the spring 160, and as a result the lower end of the lever 110 is moved toward the operator thereby moving the shaft 161 inwardly of the valve 162 which pressurizes the front port 163 allowing fluid pressure to enter the line 164 connected to the outer end of the cylinder 90 where it forces the piston therein forward toward the hopper B. As a result the shaft 91 forces the pusher plate 95 along the arcuate track 29 on the radii of the arcuate hopper B by means of the construction hereinbefore described. At the time the front port 163 is pressurized and the shaft 161 is moved inwardly of the valve 162 as above mentioned, the latch or lock 104 pivots downwardly into locked position with the upper end 109 positioned in the notch 108 which keeps the front port pressurized until the trip block 102 secured to the hollow rod 98 moves forwardly and trips the latch 104 to the position in Figures 2 and 10 thereby allowing the shaft 161 to move outwardly of the valve 162 which pressurizes the rear port 165 allowing fluid pressure to enter line 166. The line 166 enters the forward end of the cylinder 90 and the fluid pressure therein forces the piston therein rearwardly thereby retracting the pusher plate 95 to the position shown in Figures 1, 2, 3, 8 and 9. As the plate 95 reaches its rearmost position the notch 108 of the latch 104 engages the end 109 of the arm 110 as originally positioned.

When the port 153 is pressurized, the line 167 is a return line, and when the port 157 is pressurized the line 167 is also a return line. Also when either of the ports 163 or 165 is pressurized, as above, the line 168 is a return line therefor.

In using the machine, the hopper B is opened and the spring assembly and padding filler unit is placed in the bottom of the hopper. The top of the hopper is then closed and the sides moved together to compress slightly the filler unit. The casing or cover C for the cushion D is then placed on the outer open end of the hopper B and moved up to the point X. The pusher plate 95 is then caused to move forward which forces the filler unit into the casing or cover C and also forces the filled cushion from the end of the hopper B, the filler unit expanding slightly to completely fill the arcuate casing or cover C thereby producing the filled arcuate cushion D.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus for inserting a filler unit into an

arcuate open-ended casing, a base, a hopper having separable arcuate top and bottom portions, said top portion being hingedly mounted on said base, track means formed in said hopper having a curvature substantially that of said hopper, an ejector member slidably mounted on said track means, a substantially straight rod member pivotally connected to said ejector member, a cylinder pivotally mounted on said base, a piston mounted within said cylinder and connected to said rod member, hydraulic means connected to said cylinder for operating said rod by means of said piston to cause said ejector member to move on said track means throughout said hopper, hydraulic means for raising said hinged top portion of said hopper, and hydraulic means for expanding and contracting said top and bottom portions of said hopper.

2. In a machine for filling cushion covers and the like, a base, an arcuate extendable hopper mounted thereon, means for opening and closing said hopper, an arcuate track positioned in said hopper, a pusher member slidably mounted on said arcuate track, a shaft pivotally connected to said pusher member, a cylinder pivotally mounted on said base in which said shaft is slidably mounted, and piston means in said cylinder, hydraulically actuated for reciprocating said shaft to move said pusher member on said arcuate track to eject a filler unit from said hopper.

3. In a machine for filling arcuate cushion covers and the like, a base, a hopper arcuate in formation mounted on said base, means for opening and closing said hopper, means for expanding and contracting said hopper, an arcuate track mounted in said hopper, a pusher plate slidably mounted on said arcuate track, a shaft pivotally connected to said pusher plate, a cylinder pivotally mounted on said base and in which said shaft in said cylinder is slidably mounted, piston means to move said pusher plate forwardly along said arcuate track to eject a filler unit from said hopper into a cover placed thereon, and means for automatically reversing the reciprocation of said piston means and shaft to move said pusher plate rearwardly when the same reaches the full extent of its forward travel.

4. In a machine for inserting a filler unit into arcuately shaped cushions, a base, a hopper having transversely telescoping upper and lower plate members, arcuate side walls connected to said upper and lower plate members, an arcuate track mounted within said hopper and formed on substantially the same radii as said arcuate side walls, a pusher plate slidably mounted on said arcuate track, a cylinder having piston means mounted therein, a pusher shaft pivotally connected to said pusher plate, and also connected to said piston means, hydraulic means for reciprocating said piston in said cylinder to move said pusher plate along said arcuate track, and a horizontal support member pivotally mounted on said base and on which said cylinder is mounted adapted to pivot when said pusher plate is caused to travel on said arcuate track.

5. In the device of claim 4 in which said horizontal support includes a lip member formed thereon, and a support member connected to said base and having a slot formed therein in which said lip member is adapted to slide when said horizontal support is pivoted.

6. In a machine for filling arcuately shaped cushions and the like, a base, a separable hopper having arcuate walls mounted said base and open ends, arcuate guide means in said hopper ejector means slidably mounted on said guide means in said hopper adapted to travel the length of the hopper, and means for causing said ejector means to move within said arcuate hopper along the arcuate path defined by said guide means to eject an arcuately shaped filler unit from said hopper into a cushion cover placed thereon.

7. In a machine for filling cushion covers and the

like, a base, a separable open ended hopper having an arcuate formation mounted on said base, a pusher member, arcuate means in said hopper for guiding said pusher member through said hopper and means for moving said pusher member throughout said hopper on the radii of the same.

8. In an apparatus for inserting a filler unit into an arcuate casing, a base, a hopper having an arcuate formation mounted on said base, arcuate guide means mounted in said hopper, a pusher member slidably connected to and adapted to follow said guide means, a pusher shaft pivotally connected to said pusher member, a cylinder pivotally mounted on said base and in which said shaft is slidably mounted, and means connected to said cylinder for expelling or retracting said shaft with regard to said cylinder to move said pusher member on said arcuate guide throughout said hopper.

9. In a machine for filling cushion covers and the like, a base, a separable hopper having an arcuate formation mounted on said base, an arcuate track mounted in said hopper, a pusher member, means for moving said pusher member on said arcuate track throughout the length of said hopper.

10. In a cushion cover filling machine, a base, a hopper having an arcuate formation and mounted on said base, an arcuate track having the same radii as said arcuate hopper mounted in said hopper, a pusher plate slidably mounted on said arcuate track, a shaft pivotally connected to said pusher plate, and means for moving said shaft to move said pusher plate along said arcuate track throughout said arcuate hopper, said shaft moving means pivotally mounted on said base.

11. In an apparatus for inserting a filler unit into a semi-circular open ended casing, a base, a tube-like separable hopper mounted on said base and having a curvature substantially similar to that of the casing, ejector means movable along a curved path within said hopper to discharge the filler unit from the hopper into the casing, substantially straight power actuated rod means for producing movement of said ejector means in said hopper, and means for opening and closing said separable hopper.

12. The structure of claim 11 in which said rod means is pivotally mounted on said base.

13. The structure of claim 11 in which said ejector means is slidably connected to a track connected to said hopper.

14. In an apparatus for filling arcuate cushion covers and the like, a base, a hopper formed of separable upper and separable lower plate members, arcuate depending wall members connected to said separable upper plate portions, arcuate upstanding wall members connected to said separable lower plate members, means for raising said upper plate members, means for moving said upper and lower plates simultaneously horizontally to increase or decrease the width of said hopper, a pusher member, arcuate track means formed in said hopper and on which said pusher member is slidably positioned, means for maintaining said pusher member on said track means on the radii of said arcuate wall members, a shaft pivotally connected to said pusher member, a cylinder pivotally mounted on said base, said shaft connected to a piston reciprocally mounted in said cylinder, and hydraulic means for reciprocally moving said piston in such cylinder to move said pusher member throughout said hopper to eject an arcuate filler member placed therein into an arcuate cushion cover placed thereon.

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